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Natural Sciences and Engineering Research Council of Canada

NSERC Contact

Investing in people, discovery and innovation

Is Peer-Review Fatigue Setting In?

Editorial by NSERC President Tom Brzustowski

A year ago, an ACST Expert Panel noted that Canadian university researchers generally had less time to do research than did their counterparts in the US and other G-8 countries. I believe that observation is accurate, and that there may be two main reasons for it. The first one is the relatively low core funding of Canadian universities that produces high teaching loads. This is nothing new, and has been widely discussed for years. But the second possible reason is more recent and closer to home for NSERC. We are starting to hear that there is a workload problem caused by the recent growth in new programs of research support, all of which seem to have adopted peer review as a key element of their decision-making processes. The CFI, the Canada Research Chairs, and various provincial programs are examples, as well as some recent initiatives at NSERC.

There is irony in this. All of the new programs were launched to meet pressing and important needs, and all have been welcomed by researchers. At the same time, governments seem finally to have followed the lead of the research community and embraced peer review, identifying it now as the gold standard for responsible decision-making and accountability in the investment of public funds. Of course, the reservations are not about the nature of peer review; they are about the time required to do it.

NSERC is in no position to help with the core funding of universities in Canada. But if the work involved in the peer review of our programs is beginning to take away from the time that our grantees have for their own research, then we must do something about that.

When problems are identified, solutions are often volunteered. Here are some suggestions that have been made to me. "Let the GSCs review only new applicants and difficult cases. The GSC chair and NSERC staff can handle the rest." "Treat the Research Grants as the program that gives researchers their credentials and maintains quality, and let staff handle reviewing the applications in all

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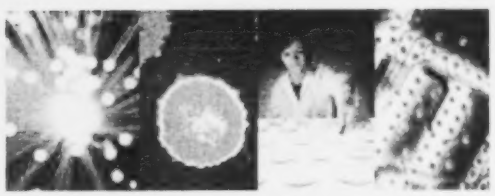

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NSERC is Canada's instrument for promoting and supporting university research in the natural sciences and engineering, other than the health sciences.

NSERC supports both basic university research through research grants and project research through partnerships among universities, governments and the private sector, as well as the advanced training of highly qualified people.

Continued from cover page

the other programs." "Reduce the size of peer-review committees." "Extend research grants to five years." "Use PROGRID, like CFI does." "Do peer review electronically; don't bring people to Ottawa for committee meetings." etc., etc. But I have also heard a very different view: "People know that NSERC peer review is crucial and they will always make time for it, so don't change anything. Let the other agencies worry about their own peer-review problems."

That last suggestion would be arrogant if it came from NSERC. And, even worse, it could prove inaccurate. I think that the workload of peer review is a subject on which we need to hear from many more in the NSERC community.

Is the workload of NSERC peer review becoming excessive for researchers? Should NSERC consider redesigning the peer-review system? Please let me have your answer to these two questions. I would appreciate both individual opinions and responses from groups of colleagues who have discussed the issue. You can reach me at exec@nserc.ca.

NSERC's peer review system is one of the principal factors in maintaining the high quality of Canadian university research in science and engineering. It is a system that works very well because the research community approaches it with a sense of duty and a commitment to integrity. My own strong preference is to leave it alone, to let it continue evolving as it has been doing, and not to attempt to overhaul it in any massive way. I believe that the issue of dwindling time for research is real and must be addressed, but I hope that the time available for research might be increased in other ways that will have a more direct and greater effect.

Nevertheless, if enough people in the NSE research community tell us this summer that their workload in peer review at NSERC is becoming onerous, to the extent that it significantly reduces the time they have to do research, then we will have no choice but to begin exploring options for change. In that event, I will ask Council at its October meeting to authorize a broad and systematic consultation, asking the NSE research community to propose how the NSERC process of peer review might be changed to reduce their workload, but in a way that preserves the values that we all consider so important.

I look forward to hearing from many of you on this important issue.

Attend Synergy 2000 This Fall

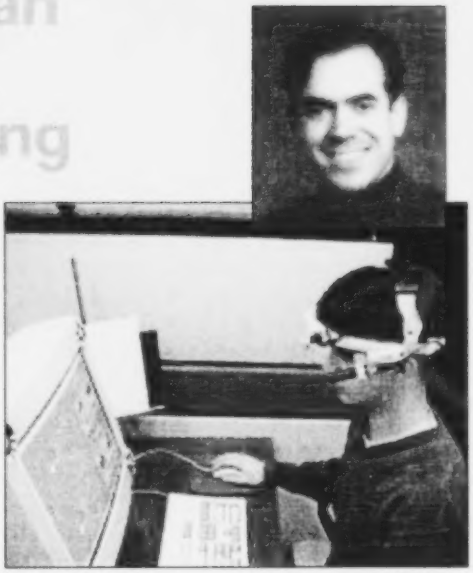
University - Industry Synergy

Once again, NSERC is teaming up with The Conference Board of Canada to honour universities and industries from across the country that are working together to develop new ways of doing things. Synergy 2000 is a national competition showcasing the best in collaborative research and development in the natural sciences and engineering.

To attend the Innovation 2000 Conference: The Grand Challenges in Managing and Sustaining Innovation, during which the awards will be presented, November 2-3 in Toronto, call the Conference Board at 1-800-267-0666 to register, or visit its Web site, www.conferenceboard.ca.

The Human Factor in Engineering

Dr. Kim Vicente



Using a device that measures eye movements, a student in Dr. Vicente's laboratory conducts research on human-computer interaction and the effect of different interface designs on human performance and attention.

It's something we can all relate to: the ever-present flashing clock on the VCR that remains unprogrammed because we can't figure out how it works.

While many of us blame our sometimes less-than-perfect relationship with technology on our lack of ability or understanding, Dr. Kim Vicente, Director of the University of Toronto's Cognitive Engineering Laboratory, attributes this type of scenario to engineers and scientists who have neglected to consider the human factor when designing technology.

"If technology doesn't work for people, then it doesn't work," says Dr. Vicente. And given how much time we all spend living and working with technology and how much money we invest in it, this is no small matter.

Speaking to NSERC staff in May as part of the Bacon and Eggheads lecture series, Dr. Vicente discussed human factor engineering, a discipline that looks at ways of designing technology to make it easier and safer for people to use.

Designers need to look at people's interaction with technology as a three-part puzzle — the technology, the tasks to be accomplished with the technology, and the human dimension, says Dr. Vicente. For us to realize the full potential of technology, these pieces must all fit together.

Programming a VCR is an everyday example of a mismatch between technology and the people using it. Played out in an industrial setting, however, the stakes can be much higher. "Take an airplane, for instance," says Dr. Vicente. "How pilots interact with technology can be a matter of life and death." Airplane crashes are sometimes attributed to pilot error, when in fact it's poorly designed technology that has led the pilot to make the mistake.

Getting the technology right is important, but it's not enough. Engineers and scientists need to know something about social sciences and the humanities. There's been a gap in this area of their education, but thanks to the emergence of human factor engineering, that gap is now closing.

As Dr. Vicente elaborates, every engineering student must take some type of economic analysis, not necessarily to become an expert in accounting but because there's no such thing as an engineering project without a budget. "Similarly," says Dr. Vicente, "no engineering project exists without some human involvement along the way. It's really about technology working for people."

New Scholarships Named for Julie Payette

Twenty-four graduate students have been awarded Julie Payette-NSERC Research Scholarships.

The new scholarships, which were approved by Council in January, are offered to the four top-ranked candidates reviewed by each of six discipline-based selection committees.

Canadian astronaut and NSERC Council member Julie Payette, who was invited to lend her name to this program, embodies the leadership qualities and excellence that NSERC is seeking to encourage and support. Winners are chosen for their academic excellence, their research ability and potential, and their leadership and communication skills.

These scholarships are valued at $25,000 per year for two years. The winners are listed on NSERC's Web site, at www.nserc.ca/schol_e.htm.

Dr. Thomas Brzustowski, recently reappointed to a second term as President of NSERC.

NSERC's Newsbureau:

A Matter of Community and Communication

For 22 years NSERC has fulfilled two fundamental and primary functions for and within the academic scientific and engineering community. These have been the allocation of federal funds for research; and the generation and management of diverse programs designed to encourage and stimulate research in the natural sciences and engineering.

A new dynamic

NSERC's traditional role has now taken on a new dynamic. However, central to this new role is the participation of the members of the community. We at NSERC need to hear from you and receive news of your research and its progress.

If you know of a company that is interested in collaborating with scientists and engineers in Canadian universities — and having NSERC share the costs — send them a copy of our new brochure, which explains how flexible our university-industry programs are.

Call (613) 995-1111 today, for copies.

The objective of NSERC's Newsbureau is to get stories of your research to the press; to place these stories on our Web site; and, ultimately, for the Web site to become a one-stop information resource for Canada's press.

Most stories that we feed to the press are gleaned from the successful research applications that are submitted annually to the agency; or from chance news reaching us of interesting activity. The number of stories supplied unprompted by researchers is woefully few.

Some of you are already using networks to share such information with colleagues and students. Relay the information to us and give us the option of considering it for the NSERC Web site where it can be accessed by an even larger audience, press and peers included. We will also be investing additional PR support for major projects.

Blowing away old assumptions

We have taken on new personnel skilled in media relations whose principal focus will be to expand existing relations with the journalists and university PR officers. Changing existing press perceptions about NSERC, which are largely limited to seeing the agency solely as an official dispenser of federal research dollars, is a significant part of the Newsbureau's campaign. We will be travelling the country to meet key press face-to-face and to plant new perceptions of NSERC in their minds.

Principal among these will be the agency's Information Age role as a major news resource connecting them to Canada's scientific and engineering research community.

At present, the Canadian press' principal references for scientific research information are foreign ones. The absence of a Canadian news service representing Canadian research is alarming, given the sheer volume of work conducted by our nation's scientists and engineers.

A dedicated research news resource

As the NSERC Web site builds up with news of your work, we will eventually develop the site into a stand-alone, dedicated information database covering the Canadian community's research news. This will be continually promoted until it becomes the logical, first port-of-call for Canadian journalists who will be given a free-of-charge subscription service to it.

When we get your stories 'out there,' everyone benefits. We will have the satisfaction of meeting our communications goals, principal among which is the creation of a significant news platform for your research. However, we cannot do it without you which is why we are asking the community to feed back into us.

Keeping the decision-makers informed

We know from our monthly Bacon & Eggheads breakfasts held on Parliament Hill, where we invite M.P.s to listen to guest speakers from our community, that the decision-makers are interested in what you are doing and stimulated by the insights researchers can provide into their work. It is also clear that they like to read of the returns on the investment made by the Canadian public in natural science and engineering research.

Therefore, your co-operation is vital in keeping the information flowing, particularly as a means to offering insights to the larger public whose investment supports us.

So please get in touch with us — and stay in touch. We can be reached at newsbureau@nserc.ca

Arnet Sheppard
Manager, NSERC Newsbureau

E-Guides: The Way of the Future

Starting this fall, the electronic versions of the *Researcher's Guide* and other program publications (see list, opposite) will be made more user-friendly, and in the fall of 2001 the print versions will be discontinued.

"MRC and SSHRC basically went electronic some time ago, and the CFI has never had any print publications. NSERC's clients are among the most 'plugged in' in the world, and so it's appropriate that we make fuller use of the Web as a means of disseminating information," said Tim Nau, NSERC's director of communications.

The new electronic versions will allow for easy printing of individual sections of publications. NSERC will also consult with researchers and research administrators to find other ways to improve the delivery of information.

NSERC will continue to provide a pdf version of its program publications after 2001, so that people who wish to can print off hard copies for themselves.

Forms will be available via the Internet, but they should still be printed off, filled in and submitted in hard copies as in the past. Electronic *processing* of forms still lies in the future.

- ***Researcher's Guide***
- ***Application for NSERC Grants*** **(Forms 100, 101, 120)**
- **NSERC *Code Book***
- ***Scholarships and Fellowships Guide***
- ***Application for an NSERC Scholarship or Fellowship*** **(Form 200)**
- ***Application for an Undergraduate Student Research Award*** **(Form 202)**
- ***Guide for Visiting Fellows in Canadian Government Laboratories***
- ***Visiting Fellowships in Canadian Government Laboratories Guide***
- ***NSERC Award Holder's Guide for Postgraduate Scholarship (PGS) Holders at Canadian Universities***
- ***NSERC Award Holder's Guide for Postgraduate Scholarship Holders in Foreign Institutions and Postdoctoral Fellows***

University Visits Scheduled for the Fall

As a result of a shortfall in NSERC's administrative budget this year, it has been necessary to make some changes to the planned fall visits.

Due to the budget constraint, some Grants Selection Committee (GSC) members and Research Grants staff will be visiting a few small universities only. The rationale for this is that feedback indicates that the benefit to the smaller institutions is greater, given the small number of faculty at such institutions with GSC experience. The schedule is posted on our Web site at www.nserc.ca/programs/rgvisit2000e.htm.

Scholarships and Fellowships staff will be visiting **Toronto** and **Montreal** on September 13, and **Vancouver** and **Halifax** on September 22, to promote their programs and brief university personnel who administer them on recent developments.

You can obtain information about the visits from your university in August and September, or from Louise Benoit, the NSERC Site Visit Coordinator, by phone at (613) 996-2985 or e-mail at louise.benoit@nserc.ca.

Environmental Assessment Update

Remember to check NSERC's Web site regularly this summer and read the fall edition of *Contact* for updates on NSERC's EA process. If you have any questions in the meantime, please contact Robert Roy, Environmental Assessment Coordinator, by e-mail at robert.roy@nserc.ca, or by phone at (613) 995-8079.

Four New SPARKS Set to Fly!

The second national NSERC-SPARK competition took place in April, and Laurentian, Prince Edward Island and Trent universities, and the Nova Scotia Agricultural College were selected to participate in the program, bringing to fourteen the total number of institutions involved.

SPARK, which stands for Students Promoting Awareness of Research Knowledge, is an NSERC program designed to train students in various aspects of communications (e.g., news release and news story writing) and promote research news to the public. Through SPARK, students are recruited, trained and paid to write stories based on the NSERC-supported research at their university.

Visit our SPARK Web page (www.nserc.ca/science/spark/index.htm) to find out more about this unique program.

Competition News, 2000-2001

Three New Research Network Grants

Coasts Under Stress

NSERC and SSHRC are funding this five-year project ($2.5M from SSHRC and $3.7M from NSERC) along with federal, provincial and community-based organizations that are providing $1.3M in cash and in kind. Rosemary Ommer, of the University of Calgary, and 60 researchers in the physical and social sciences and humanities are creating a more integrated theory of Canadian ecology, economy and society to improve our understanding of the links between social and environmental change and how they affect the health of Canadian people and places.

Mackenzie Basin Climate-Hydrological System: MAGS Phase 2

Ming-Ko Woo of McMaster University and 19 researchers at eight universities have been awarded $4.9M over five years to model the energy and water cycles that establish the climate at the earth's surface in subpolar and boreal latitudes. This network is the Canadian universities' contribution to the Canadian GEWEX study, a much larger initiative led by Environment Canada as part of the International World Climate Research program. Eight government partners and two industrial partners are providing $95,000 in cash and $10.9M in kind over five years.

Canadian Research Network on Bacterial Pathogens of Swine

The Canadian Swine Industry exports approximately 46% of its products, which accounts for over $1.1B of its annual revenue. Losses through bacterial diseases cost the industry as much as $80M per year. Mario Jacques, of the Université de Montréal, and 26 researchers have been awarded $3.1M over five years to increase knowledge of swine bacterial pathogens and develop and improve vaccines. The national and provincial pork producer organizations, two animal-health companies and seven federal and provincial government departments are providing approximately $900,000 in cash and $720,000 in kind.

Research Grants Programs

NSERC's Grants Selection Committees reviewed 4,438 applications for Research and Equipment Grants in February 2000. They recommended support for 74.6% of the applications for Research Grants and 53.4% of the applications for Equipment Grants (including Major Equipment and Major Installation Grants).

The accompanying table summarizes current commitments resulting from the 2000 competition and instalments of grants awarded in previous competitions, but excludes a small number of awards for which a decision is still pending.

A detailed list of awards and statistics are available on NSERC's Web site at www.nserc.ca/about/factstat.htm.

TIPS...

For tips on how to write a winning research grant proposal, visit our Web site at www.nserc.ca/resear_e.htm.

Grants Awarded, Including Instalments (in $000)

Grants Selection Committee	Research Grants[1]		Equipment[2]	
	No.	$	No.	$
Animal Biology	210	6,607	22	1,161
Animal Physiology	192	7,446	42	1,547
Cell Biology	292	10,718	47	1,309
Molecular & Developmental Genetics	201	8,247	31	1,057
Plant Biology & Food Science[3]	291	11,621	50	1,880
Evolution & Ecology	461	14,741	62	1,866
Psychology	376	10,708	37	840
Inorganic & Organic Chemistry	273	14,184	61	5,763
Analytical & Physical Chemistry	293	13,320	46	3,465
General Physics	132	5,158	14	960
Condensed Matter Physics	216	7,410	36	2,623
Space & Astronomy	169	6,674	11	393
Solid Earth Sciences	291	9,978	32	1,544
Environmental Earth Sciences	316	8,843	38	1,762
Pure & Applied Mathematics - A	297	4,943	4	186
Pure & Applied Mathematics - B	225	4,222	5	180
Statistical Sciences	247	5,075	9	418
Chemical & Metallurgical Engineering	478	15,121	70	4,465
Civil Engineering	475	12,253	47	2,112
Communications, Computers, & Components Engineering	354	8,909	18	1,108
Electromagnetics & Electrical Systems Engineering	286	7,976	18	791
Mechanical Engineering	516	12,772	50	2,282
Industrial Engineering	239	5,346	9	273
Computing & Information Science[4]	424	12,079	-	-
Computing & Information Science A	82	1,677	25	1,023
Computing & Information Science B	125	2,927	12	599
Interdisciplinary	84	2,172	6	322
Selection Committee on Research Grants			13	4,620
Selection Committee in Life Sciences			6	1,230
Sub-Total	7,545	231,128	821	45,780
Subatomic Physics[5]	133	15,459	7	4,290
Total	**7,678**	**246,587**	**828**	**50,070**

[1] Includes individual, group, projects, institutes, and grants to holders of Women's Faculty Awards.
[2] Includes Equipment, Major Equipment and Major Installation Grants; some equipment grants were paid with 1999 funds.
[3] Includes multidisciplinary network group grants.
[4] Historical committee.
[5] There are also 7 Major Facilities Access (MFA) awards in Subatomic Physics totalling $791K.

Competition News, continued from page 6

Collaborative Research Opportunities (CRO)

In this first CRO competition, two multidisciplinary peer panels reviewed 63 applications, requesting a total of $12,936,239 in the first year of multi-year projects. NSERC approved 15 awards totalling $3,075,922 — a success rate of 23.8% and a funding rate of 23.3%.

Many of the projects are inter-disciplinary in nature. All include international collaborations. Most frequent were collaborations with colleagues in the United States, Japan, Germany, France, Italy and Portugal.

The awards range from $102,500 to $420,000 annually, with an average of approximately $200,000.

Team size ranges from 2 to 20, with an average of 10. Seventy-seven Canadian co-applicants representing 24 universities, and 14 Canadian co-applicants representing 6 other Canadian institutions are participating in the CRO projects. The list of awards can be found on NSERC's Web site at www.nserc.ca/programs/result/2000/rg/by_gsc.htm.

University Faculty Awards (UFA)

As a result of this year's UFA competition, 22 women will take up faculty positions in universities across Canada. Award holders will receive salaries of $40,000 annually for up to 5 years, along with substantial research grants. A list of the current winners can be found on NSERC's Web site at www.nserc.ca/programs/sf/ufa-results-e.htm.

Scholarships and Fellowships

In February, NSERC's six scholarships and fellowships selection committees reviewed over 3,000 applications for support at the graduate and postdoctoral levels. Following their deliberations, NSERC offered Postgraduate Scholarships (PGS) to 1,676 students, and 227 postdoctoral fellowships to those pursuing postdoctoral research.

The table below shows the competition results. The PGS and PDF awards are distributed among the selection committees according to a formula that takes into account the number of applications and the history of awards for each committee.

TIPS...

For tips on how to prepare a winning scholarship or fellowship proposal, visit our Web site at www.nserc.ca/schol_e.htm.

Selection Committee	Award Type	Number of Applications	Number of Awards	Success Rate (%)
Engineering	PGS	366	292	79.8
	PDF	92	30	32.6
Computer and Mathematical Sciences	PGS	470	318	67.7
	PDF	76	27	35.5
Physics and Chemistry	PGS	348	244	70.1
	PDF	130	45	34.6
Earth Sciences and Ecology	PGS	457	286	62.6
	PDF	143	43	30.1
Cellular and Molecular Biology	PGS	419	260	62.1
	PDF	140	46	32.9
Life Sciences and Psychology	PGS	430	276	64.2
	PDF	113	36	31.9
Total	**PGS**	**2,490**	**1,676**	**67.3**
	PDF	**694**	**227**	**32.7**

UFA Program Expanded

In January, Council directed that the UFA program be expanded to include Aboriginal people, beginning with the 2001-2002 competition. Aboriginal men and women being appointed to university faculty positions in science and engineering may now participate in the program.

The deadline date for receipt of nominations for the next competition is November 1, 2000. For information on the UFA program, visit NSERC's Web site at www.nserc.ca/programs/schol4_e.htm.

Major Facilities Access Grants[1]

Discipline Group	Success Rate (%)	Average Grant ($)
Chemistry & Chemical/Metallurgical Engineering	66.7	68,159
Earth Sciences	60.0	51,667
Computing & Communications	33.3	60,000
Life Sciences	71.4	97,555
Materials Science	66.7	46,500
Space and Astronomy	33.3	105,000
Mathematics and Statistics	0.0	—

[1] Fourteen of 25 applications were funded.

Competition News, continued from page 7

Results of the First Competitions

Collaborative Health Research Projects (CHRP)

NSERC received a tremendous response in terms of the number and variety of research topics in its first CHRP competition. Limited budget meant that NSERC could fund only 30 of the 119 proposals, for a success rate of 25% and average annual awards of $80,000. The funded proposals are specific research projects of up to three-years' duration that have the potential to lead to health benefits for Canadians. A detailed list of awards is available on NSERC's Web site at www.nserc.ca/programs/cihr_results_e.htm.

Tri-council Workshops/ Networking Program

In 1999, NSERC, SSHRC and MRC [now CIHR] jointly held and administered two competitions. Of the total 45 proposals reviewed by the tri-council panel, 26 awards of up to $30,000 each were approved. The proposals demonstrated a high level of creativity in the multidisciplinary workshops and networking activities proposed to enable the NSERC, SSHRC and MRC research communities to plan joint projects. A list of awards is available through www.nserc.ca/programs/prognewsres_e.htm.

Genomics Projects

The timing for the introduction of this new program proved opportune given the launch of Genome Canada and the research infrastructure it will provide. In the first Genomics Projects competition, NSERC received 51 proposals requesting $8.0 million in year one. The high quality of proposals resulted in 20 awards and a success rate of 39%. The average award is $110,000 annually for up to three years. A detailed list of awards is available on NSERC's Web site at www.nserc.ca/programs/genres00_e.htm. The next application deadline is September 15, 2000, and program details can be found at www.nserc.ca/programs/cihr_genom_e.htm.

PromoScience

Creating a positive impact on Canadian youth through science and engineering

NSERC's new PromoScience program will provide grants through a competitive process to support organizations involved in the promotion of science and engineering to Canadian youth. By supporting the delivery of ongoing promotion activities and programs, PromoScience will help to motivate and inspire young Canadians to develop their interests in science and engineering in all regions of Canada.

At its meeting in January, Council approved a program budget of two million dollars — to be awarded over the first three years. There will be a call for proposals in July and the first annual competition will be held in October.

Canada Research Chairs

Will Add $900 Million to University Budgets

The Canada Research Chairs Program is the centrepiece of a federal initiative to help Canadian universities attract and keep the best researchers.

Universities will receive $900 million in support of the establishment, by 2004-05, of 2000 Research Chairs (45% of them in the natural sciences and engineering), which they can use to hire both the global research stars of today and the future research stars of tomorrow.

The new program is managed by a steering committee composed of the president of the Canada Foundation for Innovation, the deputy minister of Industry Canada and the presidents of the three granting councils, the Canadian Institutes of Health Research (CIHR — formerly the Medical Research Council), the Social Sciences and Humanities Research Council (SSHRC), and NSERC. The secretariat is located at SSHRC.

You can access the new Program Guide through www.nserc.ca/programs/can-res-e.htm.

Need a job?

Need a top-notch graduate?

The '**NSERC Concourse**' is up and running. This is a space on our Web site designed to allow students, researchers and companies to search for partners and collaborators by submitting descriptive postings. The service is offered free to individuals and organizations involved in all the research areas NSERC funds.

"The space is still somewhat embryonic, with only a handful of postings, but I think it has great potential for putting people in touch who can do each other a lot of good," said Guy Levesque. He and Dave Bowen, both Team Leaders in NSERC's Scholarships and Fellowships Division, were key players in the creation of the Concourse.

Check out the new service at www.nserc.ca/match/main-e.htm.